Cedar Lake Rehabiliation Project

Winterset Municipal Utilities
Winterset, Iowa
Madison County

WINTERSET MUNICIPAL UTILITIES

124 W. Court – Winterset, Iowa 50273
Phone: (515) 462-1422
Fax: (515) 462-1963

The Cedar Lake Rehabilitation Project

- **What is the Cedar Lake Rehabilitation Project?**
  - This is a project that was started in 2008 by the Winterset Municipal Utilities (WMU) after years of studies and attempts to create new sources of water to supply the city and citizens of Winterset.

- **Who is WMU?**
  - WMU was established in 1949 and combined Winterset's existing electric and water departments that were established in 1889 and 1909
  - WMU's primary and only water source is Cedar Lake, located in the northeast corner of the city of Winterset
  - Cedar Lake was built in 1939. It is an 80 acre lake that is located at the end of a 16,000+ acre watershed.

- **What's the problem with Cedar Lake?**
  - Cedar Lake is a 73-year old lake with a large watershed. While in times of drought, the large watershed is a huge plus, it is also the cause of considerable siltation. This has greatly reduced our primary and only supply of water.
  - In its current condition, the lake provides water for roughly 6500 customers. Continued siltation will further reduce the capacity of the lake. In the city's five year plan, the research firm of Woods and Poole Economics, Inc., of Washington, DC, is predicting Winterset will grow by 40% in the next 20 years. Winterset's population will be over 7000. With the lake currently able to only accommodate 6500, and with siltation continuing to decrease the size of the lake, the water supply will not be sustainable.
  - The declining lake capacity and cost to remedy the problem will increase water rates for Winterset businesses and residents to unsustainable levels to retain or attract business, industry or residents.
  - The large watershed, made up primarily of high quality farmland, has created some high nitrate concentration test results in the past. We have done the following to mitigate this issue -
    - Installation of a reverse osmosis system in 2007-2008 has solved this problem
    - Continue to work with land owners in the watershed to increase conservation efforts to more naturally reduce nitrates and erosion
  - In 2008, the DNR informed WMU of the necessity of making spillway repairs as soon as possible

- **What has been tried already?**
  - Many possible solutions have been studied, explored, and attempted over the past 30 to 40 years, but most have been completed without successful outcomes
    - 1968 – Jordan aquifer well and treatment plant construction
    - 1978 – Spillway repair, raising of lake 3 ½ ft, 800,000 gallon treated storage facility
    - 1990 – Water needs study completed
    - 1990 – Madison County rural water system study completed
    - 1991 – Initial look at Cedar Lake expansion
    - 1992 – Water treatment needs in event of lake expansion
    - 1993 – Update lake expansion estimated costs and building of new treatment plant
    - 1999 – DNR required study of contamination in the Cedar Lake watershed (exceeded nitrate limits 1995, 1998 and 1999)
    - 2000 – Nitrate removal or reduction ideas
    - 2001 – Watershed study of removal of nitrates through use of constructed wetlands
    - 2002 – Update and revisiting of lake expansion project and costs
    - 2005 – Nitrate study and use of reverse osmosis

- 2008 – Dredging Study
- 2008 – Use of wells along Middle or North Rivers as possible water source
- 2009 – DNR required plan of spillway repair
- 2005 – 2011 – Study of new lake construction by the Lake Commission

- **What have we concluded?**
  - The Cedar Lake Rehabilitation Project currently in action is the most promising to date from a financial and timeliness perspective.
    - The project has two primary goals
      - Dredge Cedar Lake to get back to its original capacity
      - Fix our spillway problem through creation of a dual outlet system
    - Estimated cost for the project is $15 million
      - While this is the most cost effective solution, it has been estimated we may need to greatly increase our already high water rates to cover this cost
    - Addresses the immediate risk of spillway failure
  - Other possible recent solutions discussed included:
    - Building of a new lake in Madison County
      - ✓ Cost would be over $40 million
      - ✓ Would take considerable time to complete leaving the immediate risk of lost water supply in the event of a spillway failure
      - ✓ Many regulations from many different governmental agencies have made this option prohibitive
    - Building a new dam south of Cedar Lake's current dam
      - ✓ Would take considerable time to complete
      - ✓ Best case scenario would double our current supply
      - ✓ Building a new structure results in similar 'new lake' regulations

- **Where are we in the process?**
  - Consultation with Governor Terry Branstad
    - Gov. Branstad's legislative liaison, Todd Schultz, scheduled a time for us to meet with the Governor
    - Gov. Branstad suggests assistance through the Regional Infrastructure Fund (RIF)
      - Suggested a 50% match of up to $5 million spread out over a 5-year timeframe
  - We are consulting with our local legislators and key legislators regarding the proposal to move toward inclusion of our project in the 2013 Iowa Budget
  - Engineering firm, Shive-Hattery (S-H), has completed a report of findings for the entire project. Costs are estimated at $15 million.
    - Bids for the project are on target to be requested around Memorial Day 2013
    - S-H has been working with the Iowa DNR on creation of a new primary outlet that utilizes a culvert system. This would reduce the cost of the project as our current spillway would become a secondary/emergency outlet requiring considerably less rehabilitation work
    - Study of the Cedar Lake bottom and sub-bottom is showing promising potential to more than double our current water capacity through dredging.

- **What are our next steps?**
  - January 2013 thru May 2013
    - Completion of project engineering and permitting by S-H and Terracon
    - Continue working with the Governor's office, and legislature to include our project as part of the RIF budget for 2013 thru 2018.
  - May 2013: Put out the project to bid
  - July 2013: Issue to proceed given on the dredging portion (Dam & spillway repair to commence about 30 days later)
  - September 2013: Commencement of dredging and new primary outlet construction

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

PROJECT #: 412179-0
DATE: NOVEMBER 07, 2012

CEDAR LAKE, WINTERSET, IOWA
COST OPINION - DAM / SPILLWAY IMPROVEMENTS (HIGH FLOWS)

#	ITEM DESCRIPTION	QUANTITY	UNITS		UNIT COST		TOTAL COST
5' Dam Elevation Increase and 30' Toe Berm							
1	Mobilization	1	LS	*	$30,000.00	=	$30,000.00
2	Excavation for dam raise and toe berm	64,500	CY	*	$4.75	=	$306,375.00
3	Clearing and Grubbing	2	AC	*	$8,000.00	=	$16,000.00
4	Engineering/Testing Allowance	1	LS	*	$85,000.00	=	$85,000.00
					Total		**$437,375.00**

#	ITEM DESCRIPTION	QUANTITY	UNITS		UNIT COST		TOTAL COST
Spillway Replacement							
1	Mobilization	1	LS	*	$85,000.00	=	$85,000.00
2	Removal of Existing Spillway Concrete	9,650	SY	*	$15.00	=	$144,750.00
3	Excavation and Replacement of Unsuitable Materials	9,500	CY	*	$15.00	=	$142,500.00
4	Cutoff wall	315	LF	*	$200.00	=	$63,000.00
5	Subdrain	2115	LF	*	$35.00	=	$74,025.00
6	10" Double Reinforced PCC Spillway	13,200	SY	*	$120.00	=	$1,584,000.00
7	Sheet Piling	5500	SF	*	$55.00	=	$302,500.00
8	PCC Baffle Blocks in Stilling Basin	1	LS	*	$40,000.00	=	$40,000.00
9	Class 'B' Revetment	1100	TON	*	$75.00	=	$82,500.00
10	Engineering/Testing Allowance	1	LS	*	$210,000.00	=	$210,000.00
					Total		**$2,728,275.00**

Subtotal	**$3,165,650.00**
Contingency (20%)	$633,130.00
Total Project	**$3,798,780.00**

**TOTAL PROJECT COSTS AND CONSTRUCTION COSTS PROVIDED HEREIN ARE MADE ON THE BASIS OF ENGINEER'S EXPERIENCE AND QUALIFICATIONS AND REPRESENT THE ENGINEER'S BEST JUDGMENT. HOWEVER, THE ENGINEER CANNOT AND DOES NOT GUARANTEE THAT BIDS OR ACTUAL TOTAL PROJECT OR CONSTRUCTION COSTS WILL NOT VARY FROM THE ESTIMATE OF PROBABLE CONSTRUCTION COST. THIS ESTIMATE IS INTENDED TO ASSIST IN BUDGETARY ASSESSMENT AND DOES NOT GUARANTEE THAT ACTUAL PROJECT COSTS WILL NOT EXCEED OR BE LOWER THAN THE AMOUNTS STATED IN THIS ESTIMATE.

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

PROJECT #: 412179-0
DATE: JANUARY 3, 2012

CEDAR LAKE, WINTERSET, IOWA
COST OPINION - SEDIMENT BASIN #6 FOR 1.57M CY STORAGE

#	ITEM DESCRIPTION	QUANTITY	UNITS		UNIT COST		TOTAL COST
Earthwork & Basin Construction							
1	Mobilization	1	LS	*	$75,000.00	=	$75,000.00
2	Clearing and Site Preparation	0	AC	*	$8,000.00	=	$0.00
3	Excavation, Class 10	495,000	CY	*	$4.50	=	$2,227,500.00
4	Outlet Structure	1	LS	*	$50,000.00	=	$50,000.00
5	Wetland Mitigation	0.11	AC	*	$57,000.00	=	$6,270.00
6	WUS Mitigation	0	LF	*	$25.00	=	$0.00
7	Construction Survey	1	LS	*	$10,000.00	=	$10,000.00
8	Land Acquisition	68	AC	*	$12,000.00	=	$816,000.00
9	Engineering/Testing Allowance	1	LS	*	$320,000.00	=	$320,000.00
					Total		**$3,504,770.00**

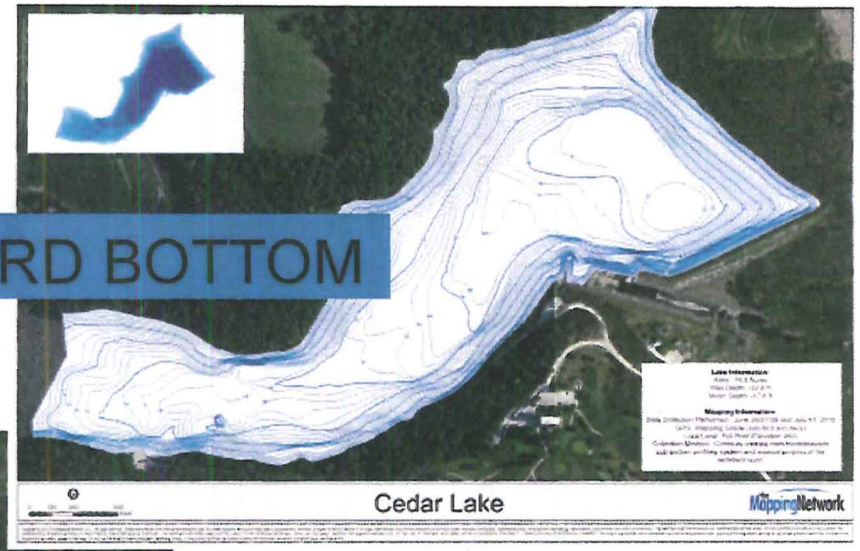
#	ITEM DESCRIPTION	QUANTITY	UNITS		UNIT COST		TOTAL COST
Dredging Operations							
10	Mobilization	1	LS	*	$350,000.00	=	$350,000.00
11	Dredging	1099000	CY	*	$4.50	=	$4,945,500.00
12	Demobilization	1	LS	*	$150,000.00	=	$150,000.00
13	Booster Pump	1	LS	*	$300,000.00	=	$300,000.00
14	Post Dredging Bathymetry Survey	1	LS	*	$15,000.00	=	$15,000.00
					Total		**$5,760,500.00**

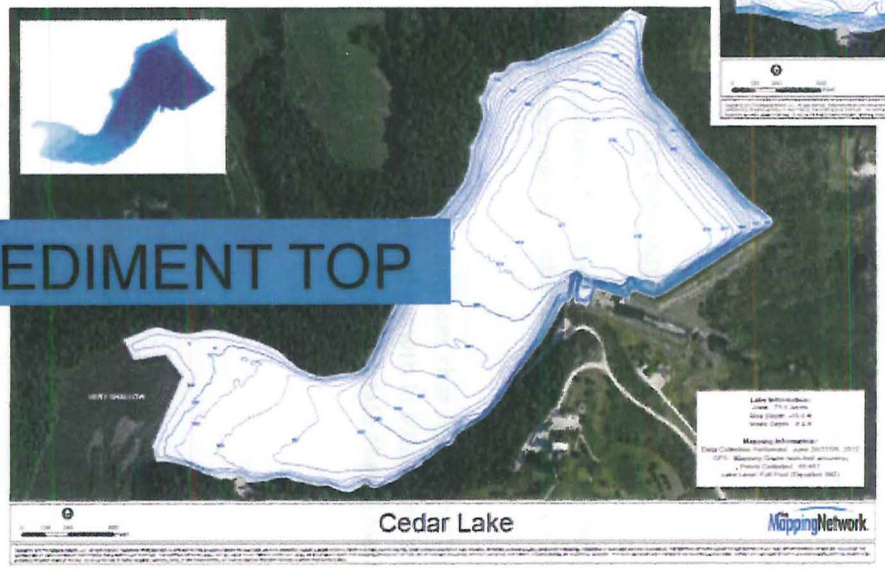
Subotal	**$9,265,000.00**
Contingency (20%)	$1,853,000.00
Project Total	**$11,118,000.00**

**TOTAL PROJECT COSTS AND CONSTRUCTION COSTS PROVIDED HEREIN ARE MADE ON THE BASIS OF ENGINEER'S EXPERIENCE AND QUALIFICATIONS AND REPRESENT THE ENGINEER'S BEST JUDGMENT. HOWEVER, THE ENGINEER CANNOT AND DOES NOT GUARANTEE THAT BIDS OR ACTUAL TOTAL PROJECT OR CONSTRUCTION COSTS WILL NOT VARY FROM THE ESTIMATE OF PROBABLE CONSTRUCTION COST. THIS ESTIMATE IS INTENDED TO ASSIST IN BUDGETARY ASSESSMENT AND DOES NOT GUARANTEE THAT ACTUAL PROJECT COSTS WILL NOT EXCEED OR BE LOWER THAN THE AMOUNTS STATED IN THIS ESTIMATE.

DREDGE ANALYSIS

- Current water volume:
  - 1,166,000 CY
  - 235,431,000 gal
- Sediment volume:
  - 1,099,000 CY





Potential water volume:

- 2,264,000 CY
- 457,313,000 gal

Terracon

WINTERSET MUNICIPAL UTILITIES

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Economic Development

Every five years the City of Winterset updates their comprehensive plan. As part of that, they have a population study done to predict what the city's population will be in the future. In the latest study, which was completed in 2012, the firm of Woods and Poole Economics, Inc. of Washington, DC did the population study and reported in the next 20 years they expect Winterset to grow by 40%.

Currently, Winterset has a little over 5000 residents. So, that would mean they are predicting, by 2033, Winterset will have 7000 inhabitants.

In its present condition, the Cedar Lake can serve roughly 6500 people. That means, within the next 20 years the Cedar Lake will no longer be large enough to service the people of Winterset.

If the Cedar Lake is dredged, it is expected it will be able to service roughly 13,000 people. Therefore, dredging the Cedar Lake will allow it to hold enough water to serve the needs of the City of Winterset well into the future.

Additionally, West Des Moines is in the process of annexing land in NE Madison County. If you go to the following address:

http://www.wdm.iowa.gov/Index.aspx?page=51

Then, click on Comprehensive Land Use Map, it will take you to their future plans.

Clyde Evans, Director of Community and Economic Development for West Des Moines, has told me they expect 50,000 people to be living in NE Madison County who will be within the new borders of West Des Moines.

While this may or may not directly impact Winterset, it certainly demonstrates that Madison County is going to be a very fast growing county. Further, it accounts for projected growth in Winterset and the need for more water capacity to serve our residents and businesses to accommodate that growth.

CEDAR LAKE WATERSHED

Winterset Municipal Water Supply Lake
Feb. 5, 2013
Winterset, Iowa
Madison County

Cedar Lake was constructed in the late 1930's (1938). Watershed is approximately 10,700 total acres. In 1973 the Lake spillway was raised 3 feet. A watershed study was completed by my office at that time.

- Average soil loss was 7.95 tons / acre / year. Estimated delivery rate was 24% = 1.91 tons average from each acre being delivered to the Lake.
- Approximately 15,376 cubic yards of soil were being delivered to Cedar Lake annually.

In 1993 a watershed study was completed by my office.

- Average soil loss was 5.1 tons / acre / year. Estimated delivery rate was 38% = 1.94 tons average from each acre being delivered to the Lake.
- Approximately 15,138 cubic yards of soil were being delivered to Cedar Lake annually.

**The static sediment delivery to the lake of the pre 2002 study was mainly caused by the increase of cropland due to the loss of pasture / hayland, offset by the increase of minimum tillage and no-till planting techniques.*

In 2002 a watershed study was completed by my office, *(DNR mapping)*.

- Average soil loss was 1.94 tons / acre / year. Estimated delivery rate was 3.6% = 0.70 tons average from each acre being delivered to the Lake. (calculated from an average 2 inch rainfall event).
- Approximately 5,548 cubic yards of soil were being delivered to Cedar Lake annually.

Landuse Breakdown for calendar year 2002, *(DNR mapping)*:

- Cropland = 8527 acres
- Pasture/hayland = 429 acres
- Woodland = 650 acres
- Other = 1094 acres

Rotations, *(DNR mapping)*:

- NT 50% / NT 80% = 1776 acres
- NT 50% / ST 40% = 59 acres
- ST 30% / NT 30% = 4664 acres
- ST 30% / ST 30% = 1974 acres
- Hay = 152 acres

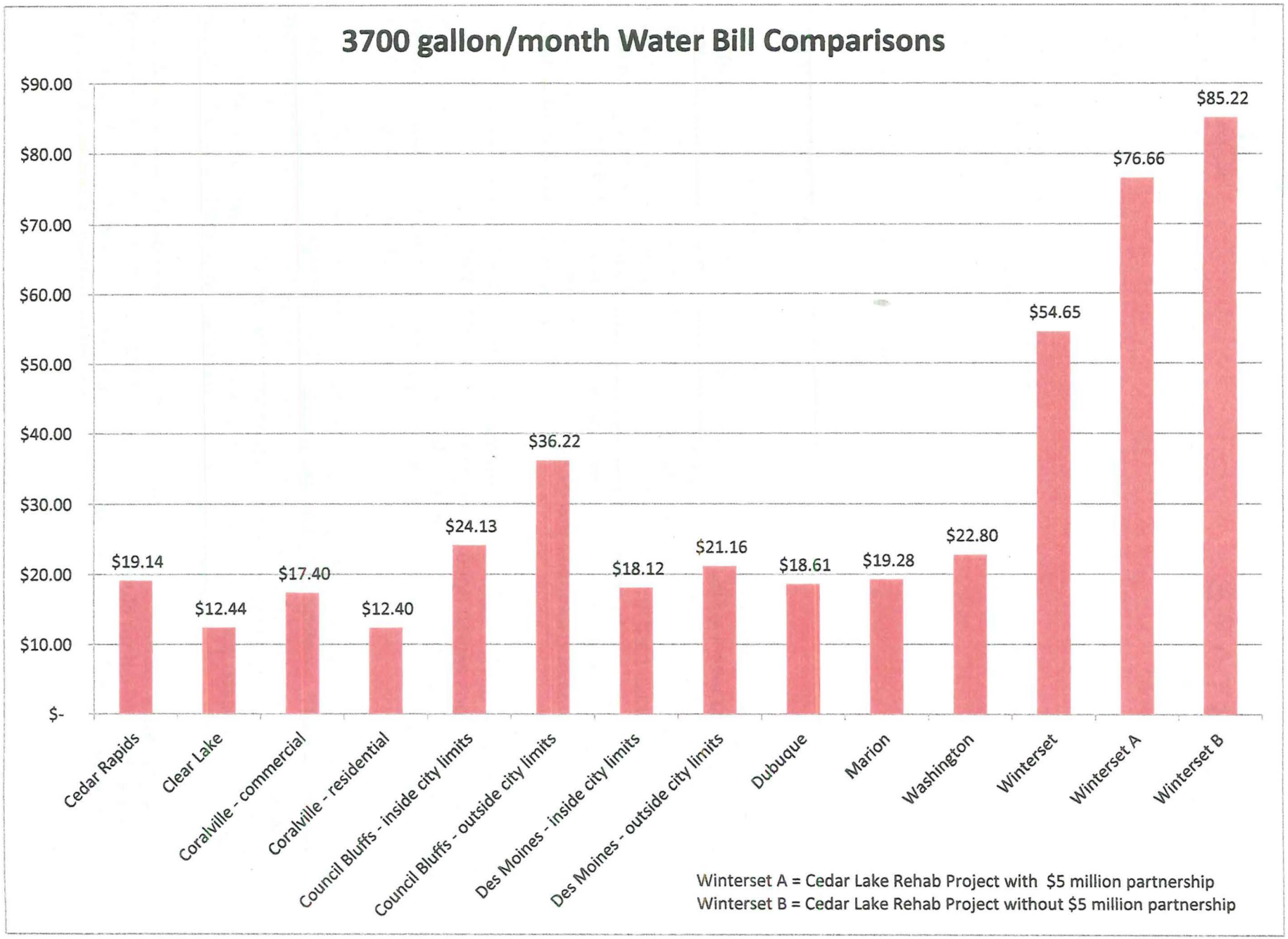
Total acres "Protected" meeting "T" (soil loss of 5 t/ac/yr) following the 2002 study = 8625 acres or 81 % of the Watershed.

**Since 2002 an additional 1610 acres have seen soil loss reductions from 6 t/ac/yr to 2.5 t/ac/yr. Some of these acres had seen changes in rotation and increased tillage since 2002, thus increasing soil loss until permanent structure were recently installed.*

WKS.

Water Bill Comparison Table

	minimum bill	approx 3700 gal/mon
Cedar Rapids	$ 12.06	$ 19.14
Clear Lake	$ 7.78	$ 12.44
Coralville - commercial	$ 12.00	$ 17.40
Coralville - residential	$ 7.00	$ 12.40
Council Bluffs - inside city limits	$ 12.89	$ 24.13
Council Bluffs - outside city limits	$ 19.34	$ 36.22
Des Moines - inside city limits	$ 9.03	$ 18.12
Des Moines - outside city limits	$ 11.29	$ 21.16
Dubuque	$ 5.31	$ 18.61
Marion	$ 16.77	$ 19.28
Washington	$ 14.56	$ 22.80
Winterset	$ 20.25	$ 54.65
Winterset - Cedar Lake Rahab with $5 million partnership	$ 15.25	$ 76.66
Winterset - Cedar Lake Rahab without $5 million partnership	$ 15.25	$ 85.22


3700 gallon/month Water Bill Comparisons
$90.00
$80.00
$70.00
$60.00
$50.00
$40.00
$30.00
$20.00
$10.00
$-
$19.14
$12.44
$17.40
$12.40
$24.13
$36.22
$18.12
$21.16
$18.61
$19.28
$22.80
$54.65
$76.66
$85.22
Cedar Rapids
Clear Lake
Coralville - commercial
Coralville - residential
Council Bluffs - inside city limits
Council Bluffs - outside city limits
Des Moines - inside city limits
Des Moines - outside city limits
Dubuque
Marion
Washington
Winterset
Winterset A
Winterset B
Winterset A = Cedar Lake Rehab Project with $5 million partnership
Winterset B = Cedar Lake Rehab Project without $5 million partnership

Iowa
Fields of Opportunities

STATE OF IOWA

CHESTER J. CULVER, GOVERNOR
PATTY JUDGE, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
RICHARD A. LEOPOLD, DIRECTOR

December 1, 2009

Scott Wesselmann, General Manager
Winterset Municipal Utilities
124 West Court
Winterset, IA 50273

Subject: Cedar Lake Dam

Dear Mr. Wesselmann:

Enclosed please find a copy of our inspection report for the referenced dam. The inspection was made as part of the department's dam safety inspection program. As noted in the report, the dam embankment was found to be in generally good condition but is becoming overgrown with weeds, brush and trees. The vegetative cover needs to be improved by clearing the woody growth and weeds, and then establishing a vigorous stand of grass. An area extending 20 feet beyond the toe of the dam and the groin areas should be maintained free of woody growth. As part of the tree and brush clearing, it is recommended that the cut stumps are chemically treated or otherwise dealt with to prevent sprouting.

As you're well aware, the spillway is in extremely poor repair. There is extensive cracking, general concrete deterioration, seepage through cracks and joints, slab movement, vegetal growth in the joints and cracks, and complete failure of one section of the spillway. Although the spillway is in very poor condition, it does not appear to have changed substantially in the last few years.

It is my understanding that the city has hired an engineer to evaluate the feasibility of repairing the existing spillway or completely replacing the spillway. The department recommends that the city has this assessment completed by January 31, 2010, and further, that it implements the recommendations of the assessment by December 2011. The spillway may be only one flood away from being completely destroyed which could result in the loss of some or the entire water supply reservoir.

The Waterworks should perform regular inspections of the spillway, especially after periods of spillway flow. Any problems observed that would further jeopardize the stability of the spillway or dam will require immediate attention. This department will continue its yearly inspection of the site.

502 EAST 9th STREET / DES MOINES, IOWA 50319-0034
PHONE 515-281-5918 FAX 515-281-8895 www.iowadnr.gov

DAM SAFETY INSPECTION REPORT

DAM:	Cedar Lake
DATE INSPECTED:	June 17, 2009
REPORT PREPARED BY:	Larry Dorgan
REPORT DATE:	June 20, 2009

PURPOSE AND SCOPE OF INSPECTION

This dam was inspected in accordance with 567-73.21(1) "d", Iowa Administrative Code. It is presently classified as a moderate hazard, major structure. The inspection was made as part of the Department of Natural Resources (DNR) dam safety inspection program under which moderate hazard, major structures are required to be inspected by department staff at least once every five years. This dam was last inspected by department personnel under the authority of the dam safety program on August 21, 2007. Due to the poor condition of the structure's concrete spillway, Dave Allen's letter of January 30, 2006 to the Winterset Municipal Utilities indicated that DNR will continue to make a yearly inspection of this site.

The general intent of this inspection is to evaluate the construction, operation and maintenance of the dam, to identify problems or potential problems of the dam and appurtenances, and to identify flood plain structures or uses which may affect the hazard class of the dam or use of the associated impoundment. This report is not intended to be an in-depth engineering investigation, but rather an evaluation based on observable conditions at the site, the contents of pertinent records and prior inspection reports, historical data, and other information available during the preparation of this report.

GENERAL NOTES

Refer to DNR'S June 16, 2005 safety inspection report for information on description of dam, general site conditions and data summary sheets.

INSPECTION RESULTS

General. The Cedar Lake Dam was inspected on June 17, 2009 by Larry Dorgan of this department. The weather on the 17th was clear with a temperature of about 85 degrees F. A relatively low amount of water is flowing over the 250 foot long L-shaped weir. Almost all of the water is going across a low section of the weir at the far left end of the weir. This low area was estimated at being approximately 40 feet in length. A majority of the water flowing down the sloped outlet section of the chute was at the far left and right ends of the 60 foot wide chute where the concrete floor is slightly lower. Photographs were taken and will be filed for future reference.

Dam Embankment. The embankment has no indications of slope instability, unusual settlement or cracking. Riprap was placed on both embankment slopes to the top of dam elevation. The

front slope has a heavy cover of brush and trees across the entire slope. The back slope has considerable brush and trees on all of the slope. The left groin area also has a heavy cover of woody growth. There was no evidence of seepage at the toe of the embankment. Riprap placed at the waterline elevation area appears to be effectively controlling wave erosion. The structure has no foundation drain system.

Spillway. The concrete chute spillway is in an extremely poor condition. The spillway appears to be in about the same condition as was noted in the 2007 inspection report. No repairs have been made to the spillway since the last inspection. The end of the present spillway where there is a vertical drop down to broken concrete, etc appears to be at about the same location as was noted in the 2007 report.

The 2007 report noted that one section at the outlet had a void under the concrete that was measured at four feet. This area couldn't be inspected this time due to water flowing across the outlet section of the chute.

CONCLUSIONS AND RECOMMENDATIONS

The dam embankment was found to be in a fairly good condition. However, the concrete spillway is in poor condition and needs to be closely monitored. Monitoring, repair and maintenance items should include the following:

(1) Clear the brush and trees from the embankment and left groin areas. These areas need to be kept in cleared condition.

(2) The concrete chute needs to be repaired or sections replaced where the concrete has lifted, sunken or otherwise is in a seriously deteriorated condition.

(3) There should be close monitoring of the lower chute area where the concrete slab has dropped down several feet.

(4) Normal operational and maintenance procedures should also continue at this site.

The Waterworks Department should perform regular inspections of the spillway due to its poor physical condition. This is especially important to do after periods of higher spillway flows. Periods of fairly high flows could do considerable damage and possibly endanger the structure. Major repairs need to be made to the spillway or replace the existing structure with an entirely new spillway

In a 5-26-2009 telephone conversation with Steve Benshoof, Winterset Municipal Utilities Water Superintendent, he stated that an engineering study was started in regards to an evaluation of the chute spillway structure. However, it has not been completed due to water running through the spillway at the present time.

Contact Agency
Winterset Municipal Utilities 515-462-3601

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING - P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF

http://www.mvr.usace.army.mil

13 November 2009

Mr. Darin O'Brien
Chairperson, Madison County Lake Commission
102 West Court Avenue
Winterset, IA 50273

Dear Mr. O'Brien:

I am writing you in response to your letter of October 19, 2009 and as a follow-up to our November 6, 2009 conference call.

You asked if the Special Aquatic Site designation takes into account quality or quantity of aquatic life that may exist in the area or if it is based solely on the attributes that define a "riffle and pool complex". You asked if all Special Aquatic Sites are protected or are there other factors taken into account as well; are all Special Aquatic Sites considered equivalent in terms of protection under the regulations? You also asked if an exemption could be granted from the Special Aquatic Site requirement to allow you to further consider construction of a reservoir even if a practicable alternative exists.

We are required to follow the 404(b)(1) guidelines contained in 40 CFR Part 230 when processing all permit actions. No exemption from these guidelines can be granted. The guidelines are the substantive criteria used in evaluating discharges of dredged or fill material into all waters of the United States, including wetlands. A key provision of the guidelines is the "practicable alternatives test" which provides that "no discharge of dredged or fill material shall be permitted in waters of the United States if there is a practicable alternative to the discharge that would have less adverse impact on the aquatic ecosystem". This means that if a discharge "may reasonably be avoided, it should be avoided". This is required for impacts to all Waters of the United States regardless of the presence of Special Aquatic Sites. The fact that there may be a Special Aquatic Site present within the proposed project area toughens the argument for avoidance of impacts where there are practicable alternatives. The quality of the Special Aquatic Site is considered when evaluating alternatives. An alternative is practicable if it is available and capable of being done after we take into consideration its cost, the existing technology, and logistics in light of the overall project purposes. The practicability of an alternative depends on whether or not it can be done, and not whether or not a specific applicant can do it for a specific cost acceptable to

them. In determining practicable alternatives, the principal prerequisite is to establish the basic purpose of the project to meet the guidelines. To be practicable, an alternative must be capable of achieving the basic purpose of the proposed project.

As discussed in our conference call, if your basic project purpose is water supply, it will be very difficult to demonstrate that there are no less damaging practicable alternatives available to you in light of the fact that water can be piped from Des Moines. If your basic project purpose is broader than water supply (eg. Water supply, Recreation, Flood Control, etc.), it may be possible to ultimately demonstrate that there are no less damaging practicable alternatives. However, a thorough evaluation of alternatives, an Environmental Impact Statement, an evaluation of cultural resources impacts, an evaluation of impacts to threatened and endangered species and a comprehensive mitigation plan would be required prior to moving forward with our permitting process. The development of this documentation is time consuming and costly and may ultimately result in a determination that there are less damaging practicable alternatives available. If water supply is your primary project purpose it may be more practical and efficient for you to pursue water supply from Des Moines and look at other alternatives to develop recreation and tourism into Madison County.

If you have any other questions or require further information on the above discussion, please don't hesitate to give me a call at 309-794-5370.

Sincerely,

Daniel J. Johnson, P.E.
Chief, Regulatory Branch
Rock Island District Corps of Engineers

CF:
District File